

a transmission circuit through which the signals generated by said monitoring device are fed to the computer;

a fluid flow variable restriction device capable of electrically and variably controlling the fluid flow status in said restrictor pipe, said fluid flow variable restriction device applying an electrical voltage within said restrictor pipe in a manner to induce a viscosity change in said electroviscous substance; and

*Q5
cond.* a receiver circuit capable of driving said fluid flow variable restriction device through the application of a control response signal applied to said restriction device from said computer.

25. (New) A video game controller incorporating the pointing device claimed in claim 24.

Please cancel claims 2, 3 and 18.

R E M A R K S

Claims 1, 4-12, 14-25 are in the case. Claims 1, 4, 6-11 and 14-20 have been amended, and claims 23-25 have been added. Supports for such amendments can be found in the entire disclosure, e.g., for claim 1, supports can be found in claims 2 and 3 as filed, for claim 4, claim 1 as filed, for claim 11, claim 13 as originally filed, for claim 14, claim 11 as originally filed, for claim 23, claims 13 and 21 as originally filed, claim 24, claims 4 and 14 as originally filed and for claim 25, claim 22 as originally filed. No new matter is believed to be incorporated.

Claims 1- 22 were rejected under 35 U.S.C. §103(a) as obvious over U.S. Statutory Invention Registration No. H703 to Repperger et al. ("H703") in view of U.S. Patent 4,632,341 to Repperger et al. ("341 Patent"). Applicants respectfully traverse.

A. Claims 1, 11 and 21

Each independent claim 1, 11, or 21 now recites a voltage driven actuator arranged in a conduit or a restrictor pipe for varying a cross-section of said conduit to restrict the flow of fluid medium therethrough. The variation of the cross-section of the conduit is caused by electrical displacement changes through control of the electrical voltage applied to the actuator. Thus, in the present invention, the voltage driven actuator *directly* induces flow resistance of the fluid flowing through the conduit or restrictor pipe in which the voltage driven actuator is arranged to vary a cross-section of the conduit or restrictor pipe.

On the other hand, H703 discloses current-pressure transducers (314, 316) regulating fluid pressure applied to a piston (312) in accordance with an electrical current flows originated from the microprocessor (318). Thus, in the H703, the fluid pressure is caused and regulated by combination of at least two elements, the transducers and the piston-cylinder assembly.

Likewise, the '341 patent discloses voltage transducer valves (316, 318) regulating fluid pressure applied to a piston (310) in accordance with an electrical voltage applied to windings (440, 442) of the valves (316, 318). Thus, in the '341 patent, the fluid pressure is caused and regulated by combination of at least two elements, the transducer valves and the piston-cylinder assembly. Therefore,

neither the H703 nor '341 patent does disclose any element which *directly* induces flow resistance as the voltage driven actuator recited in the claims.

In addition, neither the H703 nor the '341 patent does give any motivation for one skilled in the art to replace the combination of the transducer valves and the piston-cylinder assembly with the voltage driven actuator disclosed in the present inventions. Therefore, the present invention claimed in claims 1, 11 and 21 and their dependent claims is not *prima facie* obvious over the H703 and the '341 patent.

B. Claims 4, 14 and 23

Each independent claim 4, 14, or 23 now recites an electroviscous fluid as fluid medium. Neither of the references H703 nor 341 does disclose or suggest application of the electroviscous fluid as fluid medium to their invention. Furthermore, since there is no suggestion at all as to any possibility of generating feedback force by changing viscosity of the fluid medium in the references, one skilled in the art would not be motivated to use an electroviscous fluid as fluid medium in their invention. Therefore, the present invention claimed in claims 4, 14 and 23 and their dependent claims is not *prima facie* obvious over the references.

Conclusion

In view of the above amendment and remarks, Applicants submit that all of rejections in the Office Action have been overcome and all claims are now in condition for allowance, early and favorable notice of which would be appreciated.

In the event that all of the claims are not allowed, Applicants specifically request a personal or telephonic interview to discuss any remaining issues and thereby accelerate the eventual allowance of all of the present claims.



No fee is believed to be due for this submission. Should any fee be required in connection with or as an adjunct to this submission, please charge it to Deposit Account No. 16-1150.

Respectfully submitted,


Charles E. Miller

24,576
(Reg. No.)

PENNIE & EDMONDS LLP
1155 Avenue of the Americas
New York, New York 10036-2711
Tel: (212) 790-9090
Attorneys for Applicants

Date: July 9, 2000



APPENDIX A

1. (Amended) An input device for providing information with a data processing system, comprising:

means for containing fluid medium in a hermetically sealed manner;

means for communicating said fluid medium having a conduit, through which said fluid medium going out from or coming into said containing means;

means for restricting flow of said fluid medium passing through said communicating means, having a voltage driven actuator arranged in said conduit for varying a cross-section of said conduit to restrict the flow of said fluid medium therethrough;

means for applying pressure to said fluid medium responsive to direct or indirect inputs from an operator so as to change volume of said fluid medium contained in said containing means, thereby said fluid medium is passed through said communication means;

means for generating control information responsive to operation of said pressure applying means by the operator, said generated control information being input to said data processing system; and

means for generating feedback information responsive to said control information input from said control information generating means, said feedback control information being fed to said restricting means;

whereby said restricting means restricts the flow of said fluid medium through said communication means responsive to said feedback control information fed by said feedback information generating means.

4. (Amended) An input device for providing information with a data processing system **[as set forth in claim 1, wherein said fluid medium is]** comprising:

means for containing an electroviscous fluid in a hermetically sealed manner;

means for communicating said electroviscous fluid going out from or coming into said containing means;

means for restricting flow of said electroviscous fluid passing through said communicating means;

means for applying pressure to said electroviscous fluid responsive to direct or indirect inputs from an operator so as to change volume of said electroviscous fluid contained in said containing means, thereby said electroviscous fluid is passed through said communication means;

means for generating control information responsive to operation of said pressure applying means by the operator, said generated control information being input to said data processing system; and

means for generating feedback information responsive to said control information input from said control information generating means, said feedback control information being fed to said restricting means;

whereby said restricting means restricts the flow of said electroviscous fluid through said communication means responsive to said feedback control information fed by said feedback information generating means.

6. (Amended) An input device for providing information with a data processing system as set forth in claim 1 or 4, wherein said containing means and pressure applying means comprise a cylinder containing said fluid medium and a piston fit thereinto respectively, said piston enabled to be urged by the operator.

7. (Amended) An input device for providing information with a data processing system as set forth in claim 1 or 4, wherein said containing means comprises a chamber defined by a shell, said shell having an elastic membrane at least one portion thereof thereby said elastic membrane configures said pressure applying means.

8. (Amended) An input device for providing information with a data processing system as set forth in claim 1 or 4, wherein said control information generating means comprises means for detecting a position and/or a displacement provided by the operator mechanically.

9. (Amended) An input device for providing information with a data processing system as set forth in claim 1 or 4, wherein said control information generating means comprises a pressure sensor for said fluid contained in said containing means and a circuitry for transmitting an electrical signal generated by said pressure sensor to said data processing system, thereby operation of the operator is input to said data processing system as an electrical signal representing change of pressure of the fluid in said containing means.

10. (Amended) An input device for providing information with a data processing system as set forth in claim 1 or 4, wherein said feedback information generating means comprises a circuitry for transmitting an electrical signal representing the feedback information to said restricting means.

11. (Amended) An input device for improving man-machine interface comprising

a sealed chamber connected to a restrictor pipe which serves as a passageway for fluid flow from or into said chamber;

a control movement transmission mechanism wherein direct or indirect control inputs from an operator result in changes in the volume of fluid in said chamber, said changes being induced by an inflow or outflow of fluid through said restrictor pipe;

a control data generation means capable of physically monitoring the operation of said control movement transmission mechanism and converting that operation into corresponding electrical signals;

a transmission circuit through which the signals generated by said control data generation means are fed to a host device;

an electrical voltage driven actuator installed to a part of said restrictor pipe, electrical displacement changes of said electrical voltage driven actuator [a fluid flow variable restriction means capable of electrically and variably controlling] controls the volume of fluid flowing through said restrictor pipe; and

a receiver circuit capable of driving said fluid flow variable restriction means through the application of a control response signal applied to said restriction means from said host device.

14. (Amended) An input device [as set forth in claim 11, wherein] for improving man-machine interface comprising:

a sealed chamber connected to a restrictor pipe which serves as a passageway for an electroviscous substance [is utilized as said fluid, and whereby] from or into said chamber;

a control movement transmission mechanism wherein direct or indirect control inputs from an operator result in changes in the volume of the electroviscous substance in said chamber, said changes being induced by an inflow or outflow of the substance through said restrictor pipe;

a control data generation means capable of physically monitoring the operation of said control movement transmission mechanism and converting that operation into corresponding electrical signals;

a transmission circuit through which the signals generated by said control data generation means are fed to a host device;

a fluid flow variable restriction means capable of electrically and variably controlling the flow status of the substance in said restrictor pipe, said fluid flow variable restriction means [applies] applying an electrical voltage within said restrictor pipe in a manner to induce a viscosity change in said electroviscous substance; and

a receiver circuit capable of driving said fluid flow variable restriction means through the application of a control response signal applied to said restriction means from said host device.

15. (Amended) An input device as set forth in claim 11 or 14, wherein said chamber is structured as a cylinder and piston assembly, and a manually operable lever is installed to said control movement transmission mechanism as a means of changing the displacement of said cylinder through movement of said lever.

16. (Amended) An input device as set forth in claim 11 or 14, wherein an outer surface of said chamber comprises an elastic member, said member being structured so as to be directly or indirectly operable by the operator in a manner which induces a volumetric change in said chamber.

17. (Amended) An input device as set forth in claim 11 or 14, wherein an outer surface of said chamber comprises an elastic member, the surface of said elastic member being operable by means of the lever of said control movement transmission mechanism in a manner as to induce volumetric changes in said chamber.

18. (Amended) An input device as set forth in claim 11 or 14, wherein said control data generation means is capable of monitoring the mechanically moving parts of said control movement transmission mechanism or the displacement changes caused thereby.

19. (Amended) An input device as set forth in claim 11 or 14, wherein said control data generation means is capable of monitoring the pressure within said chamber.

20. (Amended) An input device as set forth in claim 11 or 14, further comprising means for returning said control movement transmission mechanism to a base point position, and for returning the fluid volume in said chamber to an initial volume, at a time when control pressure from the operator is not being applied to the control movement transmission mechanism.